THE NORTH LONDON INDEPENDENT GIRLS' SCHOOLS' CONSORTIUM

Group 2

YEAR 7
ENTRANCE EXAMINATION

MATHEMATICS

Friday 9 January 2015

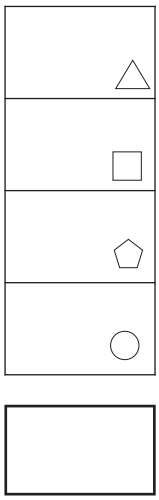
Time allowed: 1 hour 15 minutes

First Name: .....

Surname: .....

Instructions:

- Please write in pencil.
- Please try **all** the questions.
  If you cannot answer a question, go on to the next one.
- Do your rough working in the space near each question.
  Do not rub out your working as you may get marks for it.
- Calculators and rulers are NOT allowed.



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1. Work out 2345 + 678

Answer: .....

2. Work out 2345 − 678

Answer: .....

3. Work out 3024 × 8

Answer: .....

4. Work out 3024 ÷ 9

Answer: .....

5. A third of a certain number is 27

What is the number?

Answer: .....

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6. (a) Which number is 100 times larger than 0.405?

Answer: .....

(b) Which number is 1000 times smaller than 700?

Answer: .....

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7. Work out the sum of the numbers below:

0.7 **0.04** **1.006**

Answer: .....

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8. Write a number in the box to complete the number sequence below:

94 ☐ **80** **73** **66**

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9. Circle the number in the list below that is closest to $\frac{1}{2}$

$\frac{1}{5}$ $\frac{3}{7}$ $\frac{5}{9}$ $\frac{7}{11}$



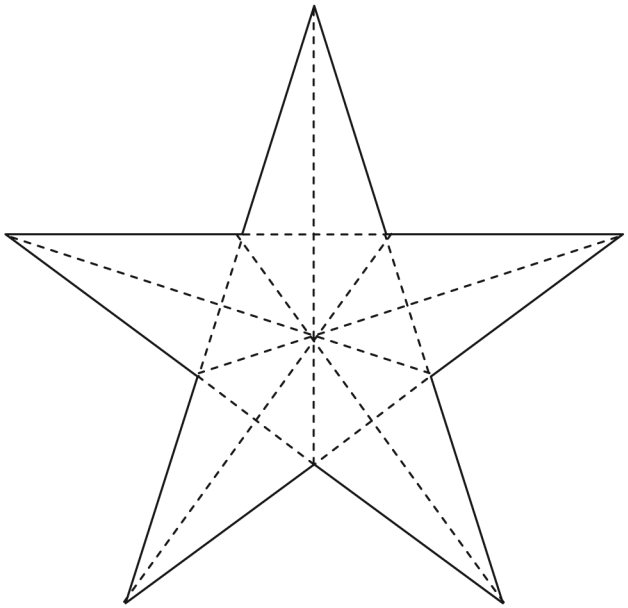
10. Write these numbers in order of size, starting with the smallest:

3.4 3.34 3.304 3.043

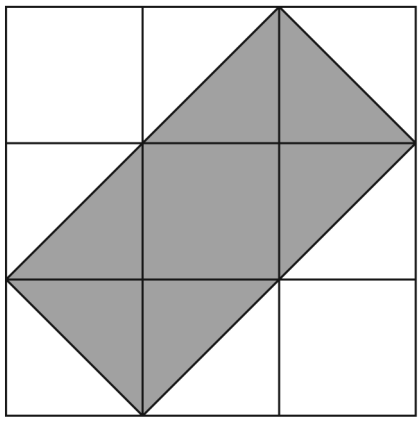
Answer: ..... , ... , ... , ...

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11. (a) Shade 40% of the shape below.



(b) What fraction of the large square below is shaded?



Answer: .....

12. Write the missing numbers in the boxes to make the calculations correct.

(a) $17 + \square = 23 \times 2$

(b) $9 + (5 \times 7) = 47 - \square$

(c) $\square \times 16 = 36 \div 9$

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13. Wombley Arena can seat 7490 supporters when full.

(a) Write this number to the nearest thousand.

Answer: .....

Bale Arena can seat 630 more supporters than Wombley Arena.

(b) How many supporters can both arenas seat altogether?

Answer: .....

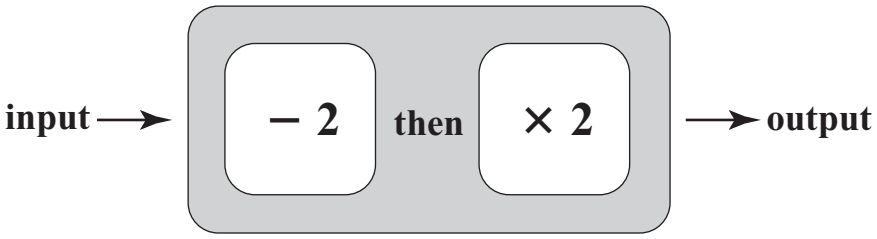
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14. Lara and Cathy have each thought of a positive whole number less than 20
The product of their numbers is 56 and the difference between them is 10

What are their two numbers?

Answer: ..... and .....

15. (a) Amy has the two-stage number machine shown below.



Complete the table of input and output numbers for Amy's machine.

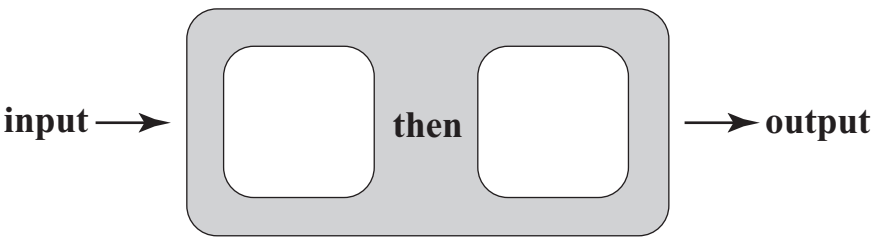
input	output
2	0
5	
	-2
-2	

(b) Hannah has a different number machine which has produced the following table of input and output numbers.

input	output
-1	-2
0	1
1	4
3	10

Unfortunately the labels have fallen off Hannah's machine.

Write suitable labels on the diagram below.



16. Katy is going to the cinema to see a film that starts at 3.25 pm and lasts 108 minutes.
At what time will the film end?
Write your answer using the 24-hour clock.

Answer: .....

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17. A shop sells coffee from Ethiopia.
The prices for coffee beans and ground coffee are shown below.



coffee beans	ground coffee
£9.40 per kg	£2.10 per 100 g

How much more does it cost to buy 250 g of ground coffee than 250 g of coffee beans?

Answer: £ .....

18. Sandy needs 12 pizzas to feed 30 people.

How many pizzas will she need to feed 35 people?

Answer: .....

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19. Belinda ate $\frac{3}{5}$ of a bar of chocolate.

60 grams of chocolate remained.

What was the original mass of the chocolate bar?



Answer: ..... g

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20. Agnes is thinking of a number which is

- one more than a multiple of 5
- one less than a prime number
- a multiple of 9
- less than 90

What number is Agnes thinking of?

Answer: .....

21. Callum buys a new laptop costing £572.50



He makes an initial payment of £136, and then pays the remainder in 6 equal monthly amounts.

How much is each monthly amount?

Answer: £ .....

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22. Given that $900 \div 12 = 75$, work out

(a) $90 \div 12$

Answer: .....

(b) $900 \div 24$

Answer: .....

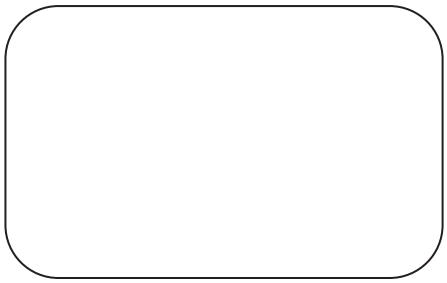
(c) 12×74

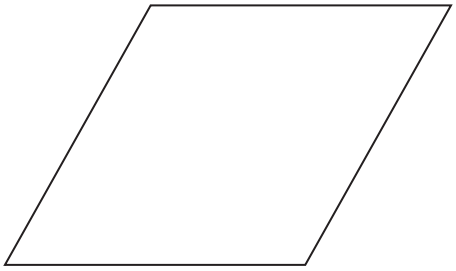
Answer: .....

(d) 75×36

Answer: .....

23. Draw all of the lines of symmetry on each shape below.



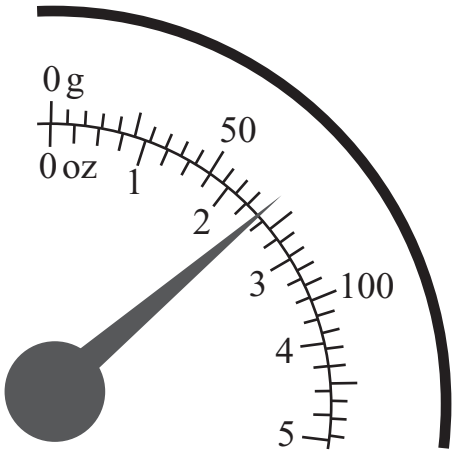


rhombus

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24. This scale shows the mass of a letter.

    The numbers around the outside are in grams (g), and the numbers inside the circle represent ounces (oz).



(a) What is the mass of the letter in grams?

Answer: ..... g

(b) A parcel has a mass of 120 g.

What is its mass in ounces?

Answer: ..... oz

25. Jessica was born on 5 January 2003 and her friend Amelia was born exactly 9 days earlier.

(a) On which date was Amelia born?

Answer: ..... th ....
day *month* *year*

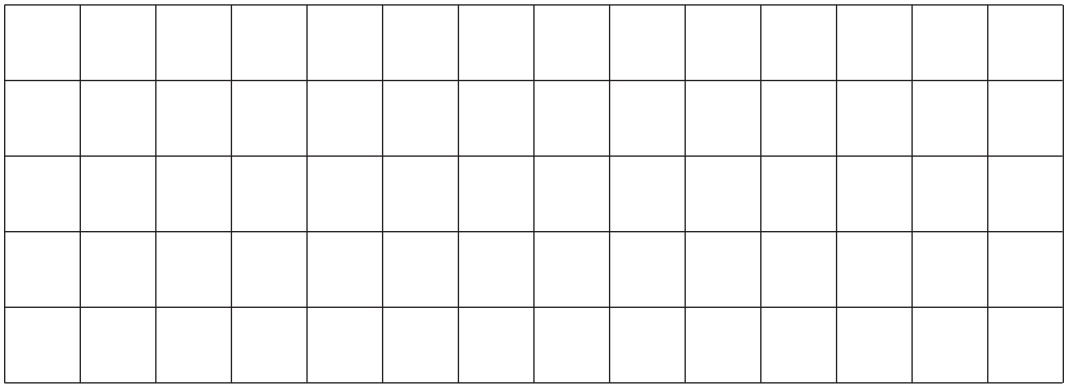
Jessica's 12th birthday was on a Monday.

(b) On what day of the week was Amelia's 12th birthday?

Answer: .....

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26. On the centimetre square grid below, draw a hexagon with area 12 cm^2.



27. Below is part of a train timetable:

	Spongeton	Bobville	Squareford	Pantsbridge
train 1	10:45	11:10		
train 2	11:30			12:40
train 3	12:15	12:51	13:22	13:45

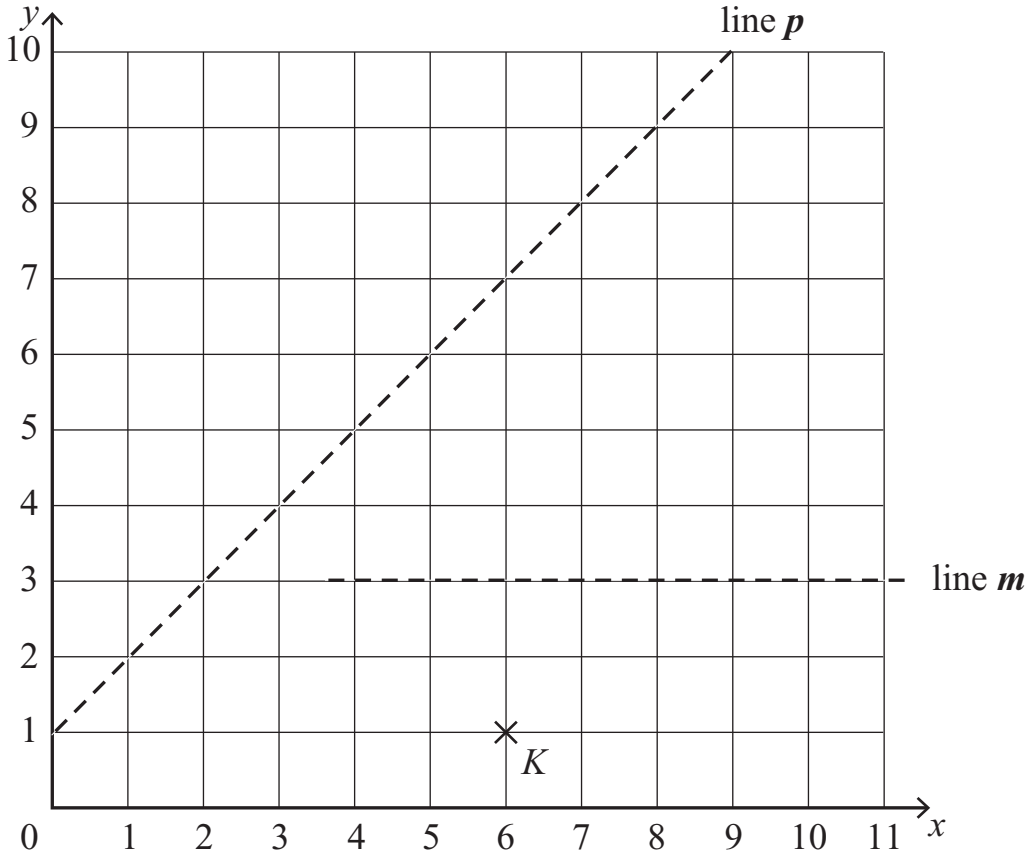
(a) Use the information below to complete the timetable.

- Each train stops at all of the stations shown.
- Train 1 takes 57 minutes to get from Spongeton to Squareford.
- Each train takes the same amount of time to travel from Bobville to Pantsbridge.
- Train 2 takes twice as long to travel from Bobville to Squareford as from Spongeton to Bobville.

(b) Which of these trains takes the longest to travel from Spongeton to Pantsbridge?

Answer: .....

28. Point K is plotted on the coordinate grid below.



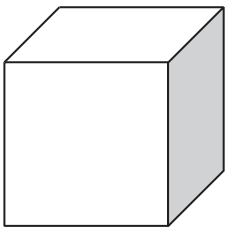
(a) Write down the coordinates of point K.

Answer: (..... , ...)

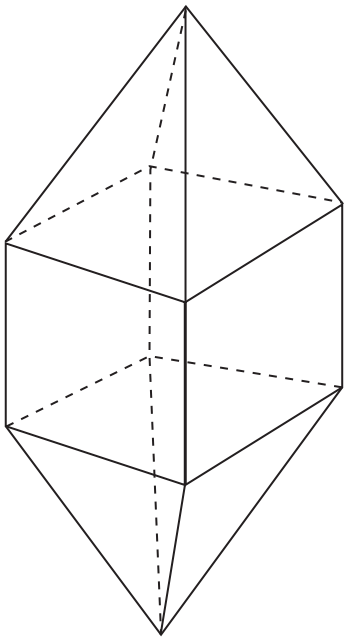
(b) Reflect point K in the dashed line ***m***.
Label this point L.

(c) Join point K to point L with a straight line.
Reflect this line in the dashed line ***p***.

29. A cube has 6 faces, 12 edges and 8 vertices.



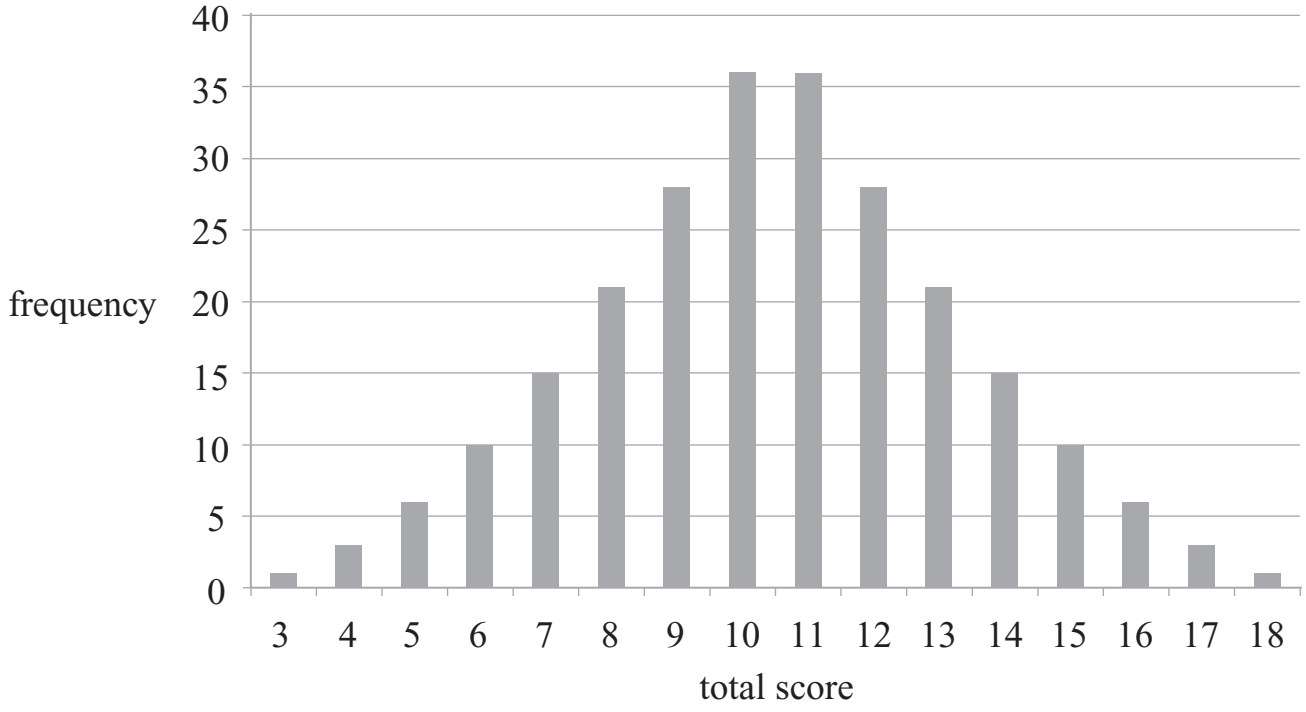
The shape below has been made by joining two square-based pyramids to a cube.



Complete the table to show the number of faces, edges and vertices of the shape shown.

faces	edges	vertices

30. Di rolls three dice and adds the numbers showing on the top faces. She repeats this 240 times, and draws a bar chart of her results, which is shown below.



(a) Which two totals occur most often?

Answer: ..... and .....

(b) How many times did Di roll a square number?

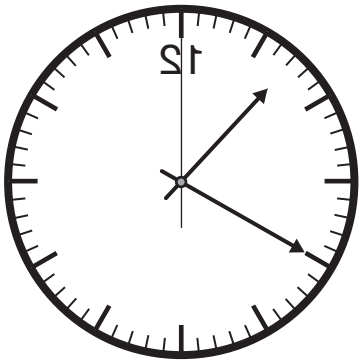
Answer: .....

(c) Di and Ed make up two games, based on Di's results.
Tick the relevant box in the table below to say who is most likely to win, or whether there is an equal chance.

game	rules	Di most likely to win	Ed most likely to win	equally likely
A	Di scores a point if the total thrown is even. Ed scores a point if the total thrown is odd.			
B	Di scores a point if the total thrown is 8 to 12 inclusive. Ed scores a point otherwise.			

31. This clock has been reflected in a mirror.

What is the actual time on the clock?

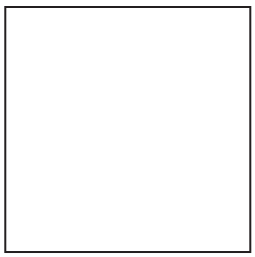


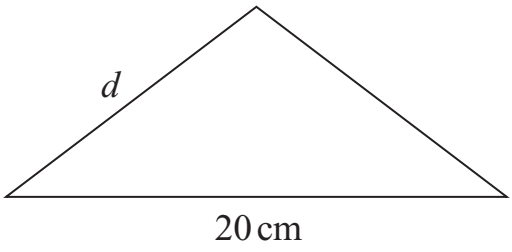
Answer: ..... p.m.

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32. In the diagrams below, the perimeter of the square is equal to the perimeter of the isosceles triangle.

Work out the length of the side marked *d*.





not to scale

Answer: ..... cm

33. (a) Six members of the Clark family have the following shoe sizes:

$$9 \qquad 1\frac{1}{2} \qquad 5 \qquad 1\frac{1}{2} \qquad 3 \qquad 4$$

For the Clark family, work out

(i) the median shoe size

Answer: .....

(ii) the mean shoe size

Answer: .....

(b) Jane has recorded the shoe size of every girl in her class.
Her results are shown in the table below.

shoe size	3	4	5	6
number of people	2	12	7	1

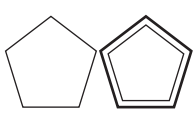
Jane says "The mode is 12".
Annabel says "The mode is 4".

Who is correct? Give a reason for your answer.

..... is correct because .....

.....

.....



34. In a quiz with 20 questions, contestants are awarded 3 points for a correct answer, but lose 2 points for each wrong answer.

Complete the table for the contestants below.

The first one has already been done for you.

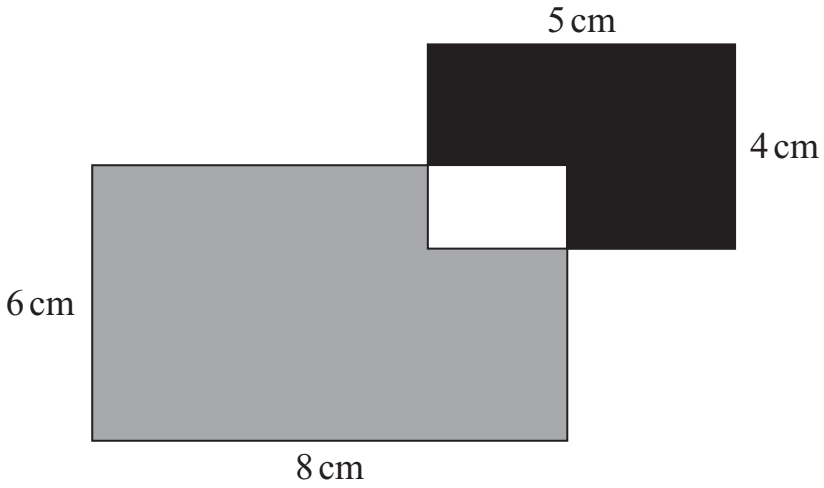
name	number of correct answers	number of wrong answers	total points
Rebecca	7	13	-5
Safiya	14		
Tosin		16	
Ursula			0

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35. The shape below is made from two overlapping rectangles.

One rectangle measures 5 cm by 4 cm.

The other measures 8 cm by 6 cm.



not to scale

Given that the area of the section shaded black is 15 cm^2, work out the area of the section shaded grey.

Answer: ..... cm^2

36. At the market, pineapples cost £1.40 each and mangoes cost 80 pence each.

(a) Maddie spent the same amount on pineapples as she did on mangoes.

Given that she bought at least one of each fruit, what is the smallest amount she could have spent?

Answer: £ .....

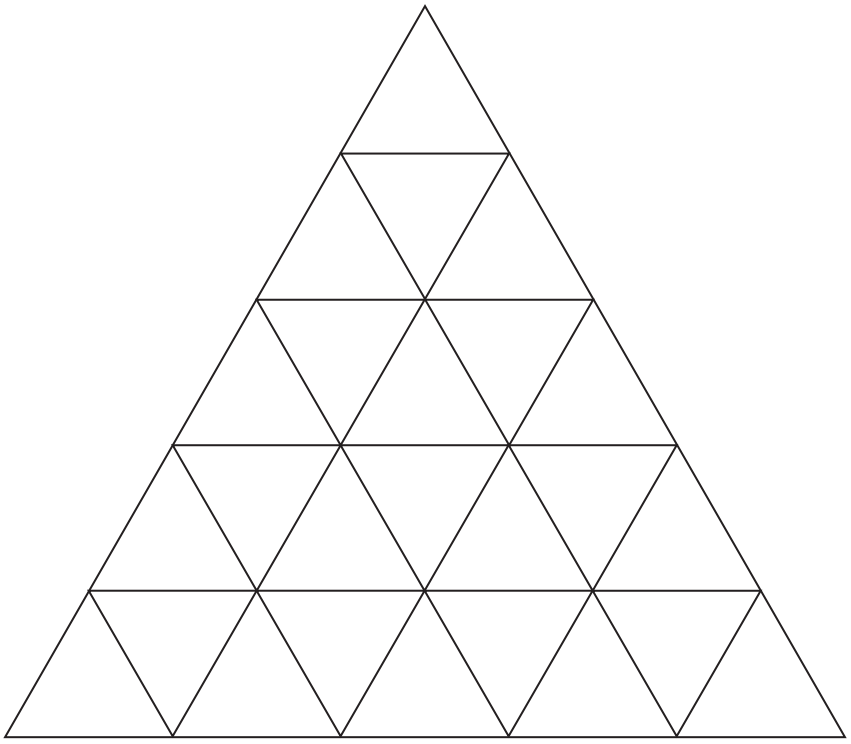
(b) Belinda spends £9 altogether on pineapples and mangoes.

How many mangoes does she buy?

Answer: .....

37. The diagram below is made from a number of equilateral triangles.

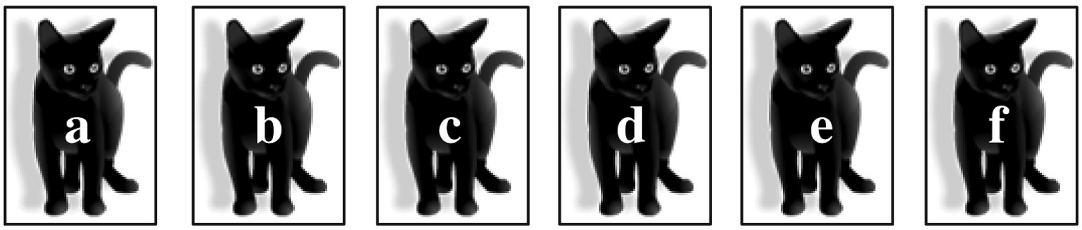
How many equilateral triangles (of any size) can be found in the diagram?



Answer: .....

38. The six cards below each have one number on the other side.
The numbers, in order of increasing size, are:

2 5 6 10 12 23



Use the clues below to work out which number is on which card.

a × b = c

b + c = d

d ÷ b = e

Answer: **a** = ... **b** = ... **c** = ...

d = ... **e** = ... **f** = ...

39. This cube has been formed by joining together small cubes.



Some of the small cubes touch other cubes on exactly 3 faces, some touch on exactly 4 faces, some touch on exactly 5 faces, and some touch on all 6 faces.

(a) For this cube, how many of the small cubes touch other cubes on exactly 4 faces?

Answer: .....

Billy makes a larger cube using small cubes.

54 of the small cubes touch other cubes on exactly 5 of their faces.

(b) How many of the small cubes only touch other cubes on 3 of their faces?

Answer: .....

(c) How many small cubes are there altogether in Billy's larger cube?

Answer: .....

40. Nicole likes palindromic numbers.

Palindromic numbers read the same backwards as forwards, for example:

44 323 1221 1234321 and so on.

(a) 11, 22, 33, 44, 55 are all palindromic.

What is the smallest multiple of 11 that is not palindromic?

Answer: .....

(b) What is the smallest number larger than 1000 that is palindromic?

Answer: .....

(c) Which two palindromic numbers less than 1000 have a difference of only 2?

Answer: .....

The palindromic number 131 has a digit sum of 5 (since $1 + 3 + 1 = 5$).

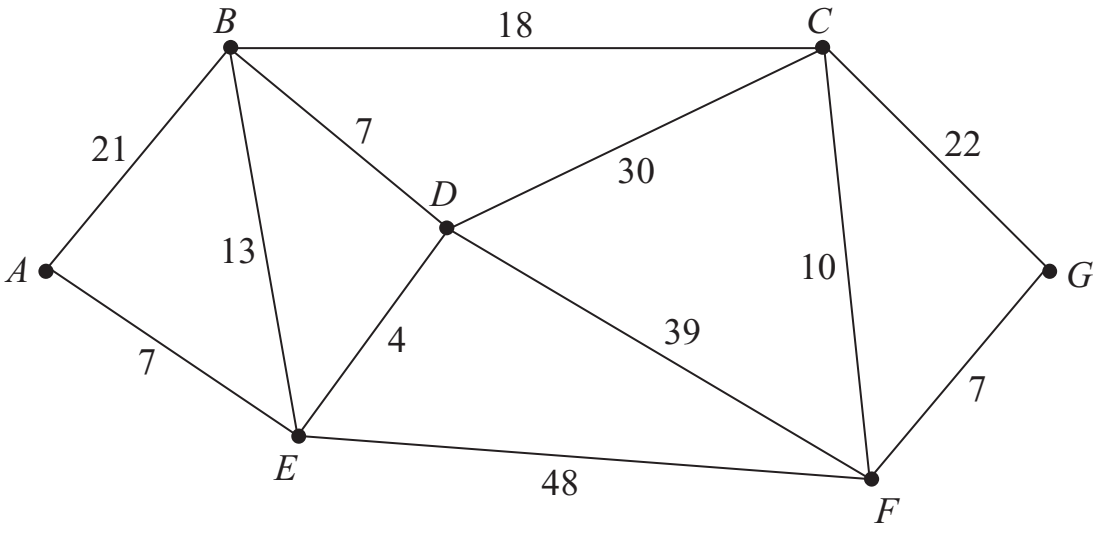
(d) What is the only other palindromic number less than 1000 which has a digit sum of 5?

Answer: .....

(e) List all of the palindromic numbers between 1000 and a million which have a digit sum of 5

Answer: .....

41. The diagram below shows 7 train stations, labelled *A* to *G*, and the times, in minutes, taken to travel between stations.



(a) Assuming that no time is added to the journey when a train passes through a station, work out the route that takes the shortest time to travel from *A* to *G*.

You should list the stations in order.

Your route **does not** need to pass through every station.

Answer: *A* ..... *G*

In reality, passing through a station adds 4 minutes to the overall journey time.

(b) Using this information, work out the shortest time taken to travel by train from *A* to *G*.

Your route **does not** need to pass through every station.

Answer: ..... min

(Total: 100 marks)